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State of Ohio Environmental Protection Agency
P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149

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Toward A Cleaner Environment
15 Year Anniversary 1972 - 1987

Richard F. Celeste
Governor

Mr. Jim Brossman, Unit Chief
Ohio-Minnesota/RCRA Enforcement Unit
Hazardous Waste Enforcement Branch 5HE-12
USEPA, Region V
230 South Dearborn Street
Chicago, Illinois 60604

September 29, 1987

Dear Mr. Brossman:

Please find enclosed the final CME report documents for Envirosafe Services of Ohio, Inc. (Fondessy), GMC Fisher, Elyria, Ross Incineration Services and U.S. Steel, Lorain.

The documents were prepared by Cindy Young, Jan DeLorenzo and Lindsay Taliaferro of the Division of Ground Water, Central Office and Don Easterling of our Northeast District Office, respectively.

Should you have questions, please contact me at (614) 481-7180.

Sincerely,

Timothy P. Krichbaum

Timothy P. Krichbaum
Supervisor
Solid and Hazardous Waste Unit
DIVISION OF GROUND WATER

TPK:sam
0005g-26

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Enclosures:
1. Envirosafe Services of Ohio, Inc. (Fondessy)
2. GMC Fisher, Elyria
3. Ross Incineration Servies
4. U.S. Steel, Lorain

cc:
Joe Morbito, USEPA, Region V
Craig Liska, USEPA, Region V
Martha Gibbons, OEPA, DSHWM
Mike Savage, OEPA, DSHWM
Dave Sholtis, OEPA, DSHWM (w/enc. 1 thru 4)
Tom Crepeau, OEPA, DSHWM (w/enc. 1 thru 4)
Jenny Tiell, OEPA, Legal Office (w/enc. 3 & 4)
Joan DeMartin, OEPA, Legal Office (w/enc. 2)
Gary Martin, OEPA, DGW
Jan DeLorenzo, OEPA, DGW (w/enc. 2 & 3)
Lindsay Taliaferro, OEPA, DGW (w/enc. 3)
Cindy Young, EOAP, DGW (w/enc. 1)
Dave Wertz, OEPA, NEDO (w/enc. 2, 3 & 4)
Don Easterling, OEPA, NEDO (w/enc. 4)
Chuck Hull, OEPA, NWDO (w/enc. 1)
Dan Hanket, AGO (w/enc. 2 & 3)
Paul Cotter, AGO (w/enc. 4)

COMPREHENSIVE MONITORING EVALUATION

OF

GENERAL MOTORS CORPORATION - FISHER GUIDE DIVISION, ELYRIA, OHIO

OHD004201091

September 28, 1987

TABLE OF CONTENTS

GENERAL INFORMATION

Purpose

The purpose of this report is to document the results of a Comprehensive Ground Water Monitoring Evaluation (CME) at GMC Corporation - Fisher Guide Division, Elyria, Ohio. A CME is a indepth evaluation of the adequacy of a facility's ground water monitoring network.

Information Sources

This report is based upon an extensive record review and an inspection of the facility conducted on September 4, 1987. In addition to the Ohio Environmental Protecton Agency (OEPA) files and information gathered from observations made during the inspection, the following documents provided information upon which this report is based:

1. Part B Permit Application of November 8, 1985.

2. Supplementary Annual Ground Water Reports for 1982, 1983, 1984 and 1985.

3. Report Containing Geological/Hydrological Investigations, Ground Water Monitoring Program, and Outline of Ground Water Assessment Plan, September 1981, Camp Dresser & McKee Inc.

4. General Motors Corporation, Fisher Body Division, Ground Water Investigation, August 16, 1984, Ground Water Technology, Inc.

5. Results of Ground Water Investigation, Fisher Body Plan, Elyria, Ohio, February 1985, Ground Water Technology, Inc.

6. Report on Ground Water Quality Assessment Program - Proposed Plan for Phase II, October 1986, The Chester Engineers.

7. Draft Ground Water Quality Assessment Plan Phase 2, December 1986, Roy F. Weston, Inc.

8. Ground Water Quality Assessment Plan Phase 2, May 1987, Roy F. Weston, Inc.

9. Lower Black River Comprehensive Water Quality Report, 1985, Ohio EPA.

10. Closure Plan Hazardous Waste Management Facility , Fisher Guide Division, General Motors Corporation, Elyria, Ohio Plant, May 1987.

Inspection Checklists

Attached to this report are several checklists from the Interim Status Ground Water Monitoring Program Evaluation (SW-954). The checklists deemed appropriate for this facility are:

APPENDIX A: COMPREHENSIVE GROUND-WATER MONITORING EVALUATION WORKSHEET

APPENDIX A-1: FACILITY INSPECTION FORM FOR COMPLIANCE WITH INTERIM STATUS STANDARDS COVERING GROUNDWATER MONITORING

APPENDIX A-2: INSPECTION COMPLIANCE FORM FOR A FACILITY WHICH HAS DETERMINED IT MAY BE AFFECTING GROUNDWATER QUALITY

SITE HISTORY AND OPERATIONS

Facility Name: General Motors Corporation - Fisher Guide Division, Elyria, Ohio

EPA I.D. Number: OHD004201091

Facility Location:

The General Motors Corporation (GMC), Fisher Guide Division is located in Lorain County, Ohio, at 1400 Lovell Street, in the City of Elyria. The plant is situated at the northern outskirts of the City of Elyria in the midst of a rural and residential setting. Figure 1 depicts the site location of the GMC Fisher Guide Division.

Facility Description

The GMC-Fisher Guide Plant manufactures approximately 1,600 automotive component parts for General Motors vehicles according to the Part B Application. These parts include assorted plastic and metal automotive hardware, plastic interior/exterior trim, urethane foam seat backs, cushions, and arm rests. The processes involved in these manufacturing activities include machining, stamping, forming and welding of metal parts, metal coating, prime/finish painting, thermoforming and injection molding of themoplastic parts, and foam molding. The facility site plan is depicted in Figure 2.

Waste Materials Generated and Disposal Practices

Waste materials generated at the GMC-Fisher Guide Plant include electroplating wastes (EPA Hazardous Waste Code F006) and the chemically stabilized sludge-like materials resulting from CHEMFIX ^{R} process treatment of the wastes. The CHEMFIX^{R} product is a chemically and physically stable solid with characteristics similar to that of a clay soil. Fisher Guide operates its own wastewater treatment facility at the Elyria Plant to treat all process wastewater from plant operations. Wastewater treatment includes hexavalent chrome reduction, pH adjustment, metals precipitation, water/solids separation, sludge dewatering, oil emulsion breaking, and oil/water separation. The effluent from the wastewater treatment operation is discharged to a storm sewer, and is regulated under NPDES permit #S301*BD. No wastes from outside sources are accepted for treatment, storage, or disposal at this facility.

According to the Part B Application, the waste water treatment plant also incorporates two open concrete tanks for the purpose of decontaminating inactive production equipment. Demolished piping, tankage, and assorted plating equipment are occasionally placed in these tanks for the purpose of rinsing them prior to disposal. The rinse water from this decontamination process is directed into the waste water treatment facility. The decontamination tanks are considered part of the waste water treatment process and are regulated under the Clean Water Act.

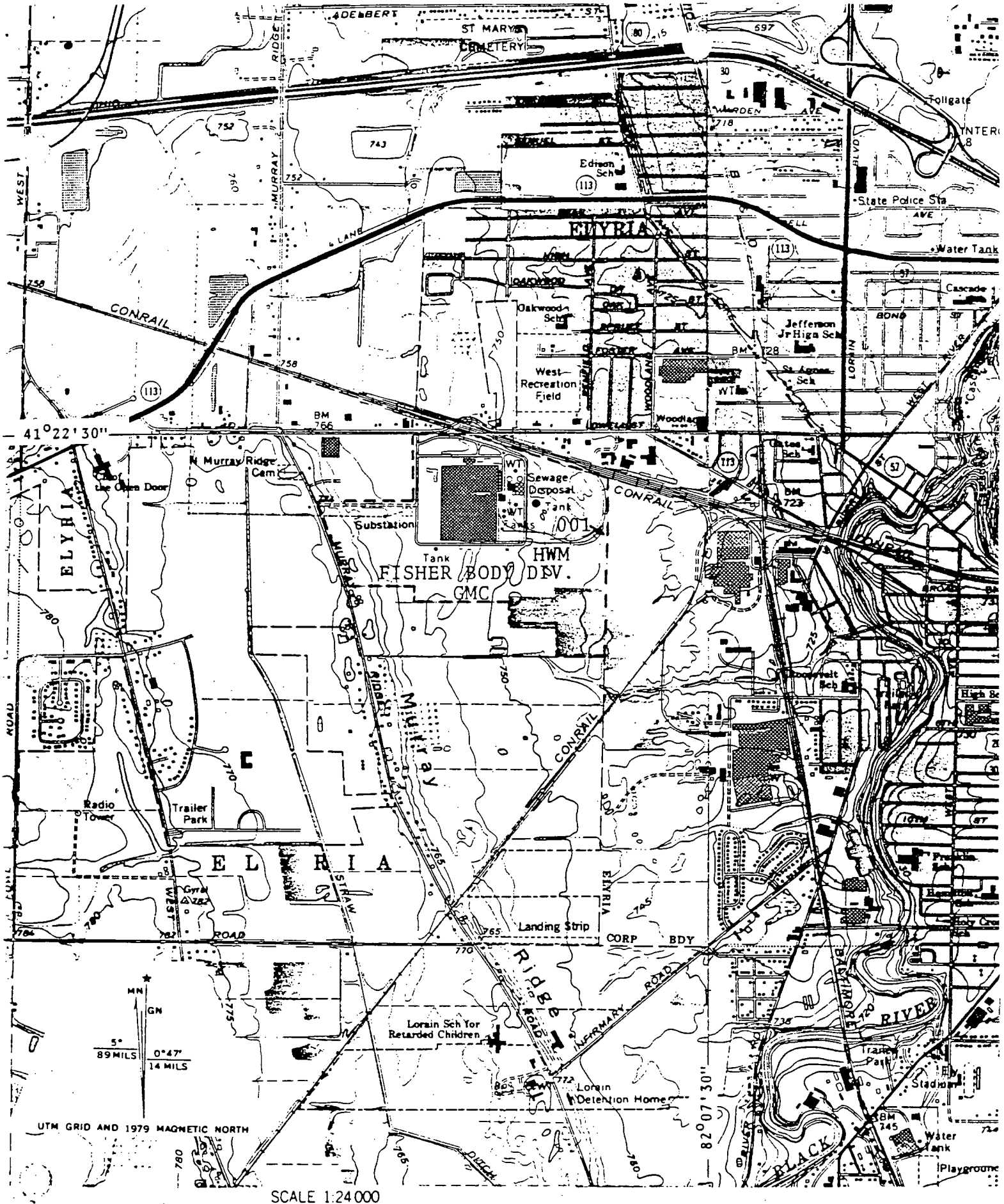


Figure: 1

FISHER BODY DIVISION
GENERAL MOTORS CORPORATION

COMPOSITE FROM
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
AVON, GRAFTON, OBERLIN, LORAIN

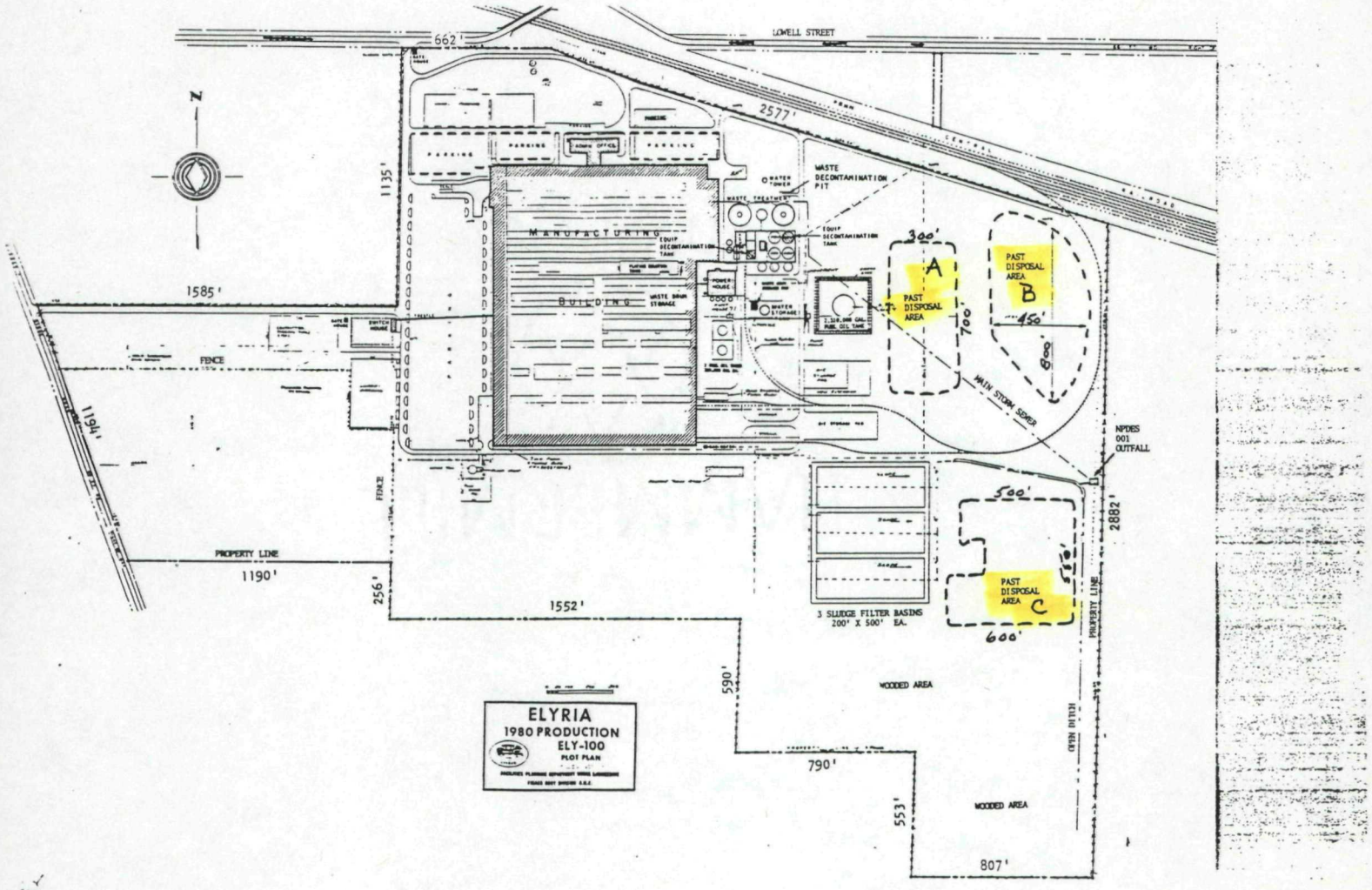


Figure 2: Facility Site Plan

The wastewater treatment facility also included three sludge dewatering impoundments located south of the manufacturing building. These impoundments were used to dewater metal hydroxide wastewater treatment sludge (F006 U.S. EPA Waste ID Code) resulting from electroplating operations. As of July 31, 1984, the Elyria plant discontinued the majority of its electroplating operations. According to the Closure Plan (April 1984), this change effectively reduced the sludge loading of the wastewater treatment plant to the extent that sludge dewatering could be accomplished by means other than the dewatering impoundments. Consequently, Fisher Guide has pursued revisions to its wastewater treatment facility to incorporate a plate filter press for the dewatering of sludge as it is produced. This has eliminated the need for the three dewatering impoundments and allowed for their closure. The Closure Plan was approved on August 7, 1987 and recommended that the lagoons be closed as a hazardous waste landfill with at least 30 years of post-closure ground water monitoring. The lagoons were in the process of being filled in and graded on the date of the CME inspection.

The location of the three sludge dewatering impoundments is shown in Figure 2. Each impoundment was 200 feet wide by 500 feet long, and was enclosed entirely by earthen berms. Each impoundment had a useful sludge holding depth of three to four feet (4'), with a maximum capacity of 13,000 cubic yards of sludge. The bed of each impoundment was comprised of successive layers of sand and gravel above a network of four inch drain tiles. This underdrain system allowed the water in the sludge to percolate into the drainage network and be conveyed by gravity to the storm sewer.

According to the Ground Water Quality Assessment Plan Phase II (May 1987), a partial waste characterization of the surface impoundment sludges was performed in 1982. The impoundments were divided into quadrants. A sample was collected from each quadrant and analyzed for RCRA parameters to determine its status as a hazardous material. The sludges were found to be non-hazardous with respect to pH, flash point, corrosivity, and reactivity. Analyses of various total metals are presented in Table 1. The results show nickel, chromium, copper and zinc in the largest concentrations, with only a small fraction of the total chromium consisting of the hexavalent ion. The May 1987 Assessment Plan proposed sampling the sludges in the surface impoundments for 35 Hazardous Substance List volatile organic compounds. This sampling was conducted in June 1987 and the results of the analysis are being reviewed currently by Ohio EPA.

In addition to the above described wastewater treatment plant for the electroplating wastes, the GMC-Fisher Guide plant also has a treatment facility for neutralizing non-reacted raw materials used in urethane foam modeling (toluene diisocyanate). This facility consists of two open concrete tanks into which open drums of waste raw materials are placed and allowed to fully react. The neutralization of toluene diisocyanate (TDI) is assisted by the addition of water at this site. Fully reacted foam is subsequently disposed off-site in an approved landfill. This treatment process is not being regularly used and the Closure Plan proposed to close this facility.

TABLE 1

SUMMARY OF AVERAGE TOTAL AND EP-TOXICITY*
METALS DATA FOR SURFACE IMPOUNDMENT SLUDGES

Total Metals (mg/kg)	Basin 1	Basin 2	Basin 3	U.S. EPA EP-Toxicity Guidelines
Nickel	6000	7125	2850	NA
Cadmium	<2	<2	<2	NA
Chromium	23,550	26,075	11,700	NA
Hexavalent Chromium	9.70	3.33	0.54	NA
Lead	46	144	37	NA
Copper	3500	5640	3630	NA
Zinc	2660	1780	1200	NA
Iron	3400	3220	1260	NA
EP-Toxicity Metals (mg/l)				
Aresenic	<0.001	<0.001	<0.001	5.0
Barium	<0.05	<0.05	<0.05	100
Cadmium	<0.02	<0.02	<0.02	1.0
Chromium	4.1	9.0	10.3	5.0
Lead	<0.11	<0.082	<0.082	5.0
Mercury	<0.001	<0.007	<0.002	0.2
Nickel	11.8	24.0	8.4	NE
Selenium	<0.001	<0.001	<0.001	1.0
Silver	0.03	0.03	0.1	5.0

*Taken from Groundwater Quality Assessment Plan Phase II, May 1987.

NA - Not applicable

NE - Not established

Note: All analyses performed by Chester Laboratories. Samples were collected on 6/24/82.

Regulatory History

The following list summarizes major regulatory activities at the GMC-Fisher Guide Plant.

- Ohio EPA received the Part B Application on November 12, 1985.
- A final draft Closure Plan was received by Ohio EPA on April 17, 1986
- A Facility Management Plan (FMP) for the GMC-Fisher Guide Plant was submitted to U.S. EPA on March 10, 1986 by Ohio EPA.
- A CERTIFICATION REGARDING POTENTIAL RELEASES FROM SOLID WASTE MANAGEMENT UNITS was received by Ohio EPA on February 18, 1986.

  The CERTIFICATION REGARDING POTENTIAL RELEASES FROM SOLID WASTE MANAGEMENT UNITS lists past disposal areas (solid waste management units) which may be presently impacting ground water quality. These units are depicted in Figure 2 and are described as follows:

  * Past disposal area A - This area was used for open burning of general plant trash from 1947 to 1957 and is covered with soil and overgrown. No records for estimates of contents or volume are available.

  * Past disposal Area B - This area was used as a surface impoundment for wastewater treatment sludge from 1956-1967 and was allowed to dry. It was covered with soil in 1970 and is now overgrown. The sludge was believed to be F006 and volume is estimated at 25,000 cu yd.

  * Past Disposal Area C - This area was used from 1972 to 1987 for burial of F006 sludge from the surface impoundments. Topsoil was replaced and the area is now overgrown. The volume of disposed sludge is estimated to be 40,000 cu yd.

- On March 2, 1987 the Ohio Attorney General's office filed a complaint in Lorain County Common Pleas Court alleging that the General Motors Corporation Fisher Guide Division in Elyria violated Ohio environmental law. This complaint charged the company with eight violations. There were three ground water related violations which are summarized as follows:

  1) General Motors Corporation has stored and disposed of industrial waste and other waste substances in three surface impoundments at its facility that are not liquid tight. Contaminants placed in the impoundments have entered the ground water causing pollution of the waters of the state without a permit.

  2) By utilizing surface impoundments that are not liquid tight for the storage of hazardous waste, the company has failed to maintain and operate their facility so as to mininize the possiblity of any unplanned sudden or non-sudden release of hazardous waste or hazardous waste consitutuents to the air, soil or surface water which could threaten human health or the environment.

3) General Motors Corporation has failed to determine the extent of migration and concentrations of the hazardous waste or hazardous waste constituents in the ground water at the facility.

- A Consent Decree has been signed by both GMC officials and the Ohio Attorney General's Office. The document was signed by a judge on September 23, 1987.

SITE HYDROGEOLOGY

Geologic Setting

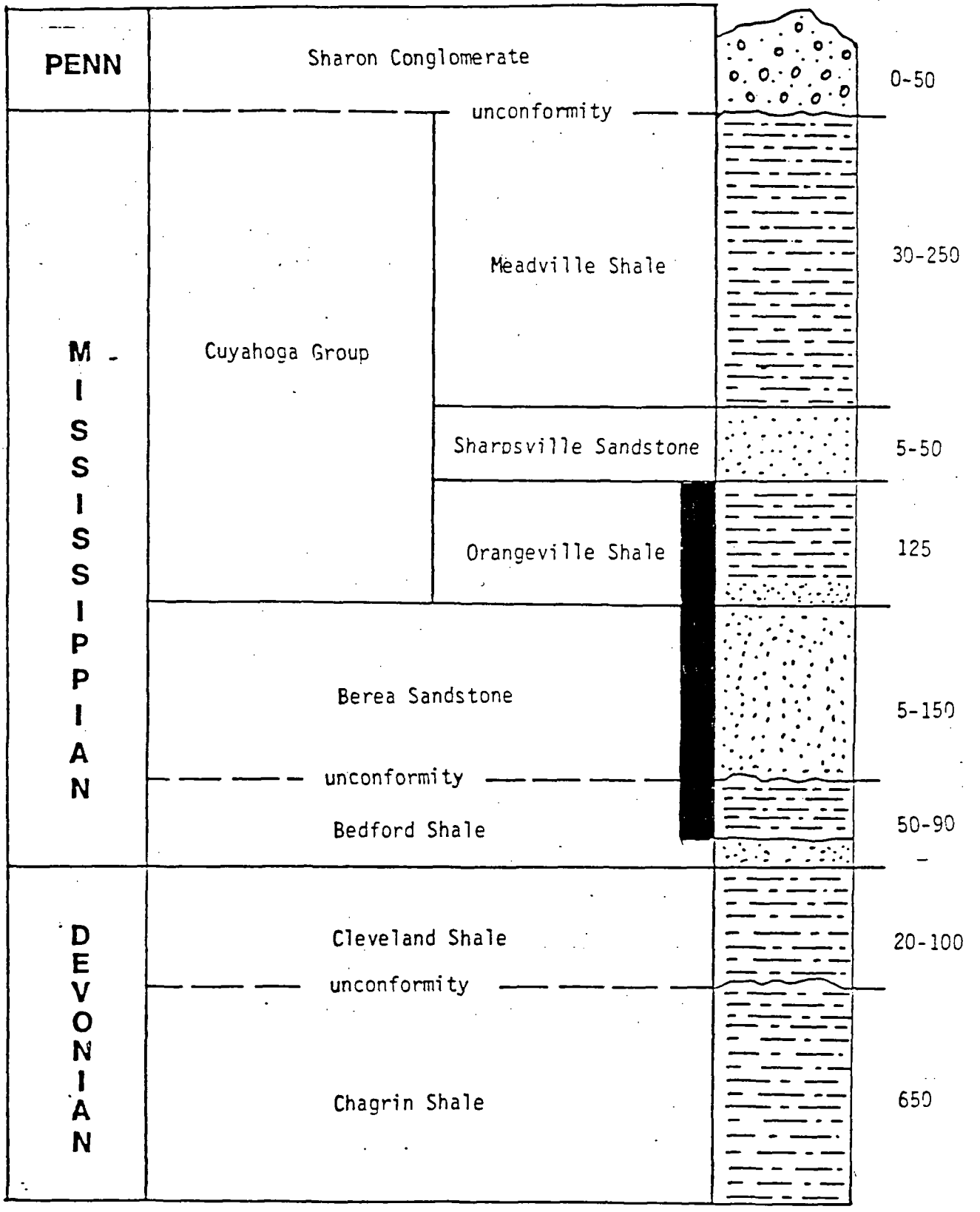
The GMC-Fisher Guide facility is situated within the Interior Lowlands Physiographic Province, an area of relatively flatlying sedimentary rock ranging from Pennsylvanian to Cambrian in age. The thick deposits of relatively soft sedimentary rock lie directly on the Precambrian basement rock. In the area of the facility, a thin veneer of soft till, deposited during the Wisconsin glacial event, overlies the site to thicknesses of 12 feet. Bedrock underlies this till deposit at relatively shallow depths. A geologic column identifying the units that would be encountered in Lorain County is shown as Figure 3.

Hydrogeology

The Draft Ground Water Quality Assessment Plan, Phase II divided the geology in the vicinity of the GMC-Fisher Guide facility into four stratigraphic units based on boring logs of existing on-site monitor wells. Geologic cross-sections developed from well logs are present in Figures 4 and 5. The description of the stratigraphy is as follows:

> The uppermost unit consists of soft, light brown to greenish gray silty clay till deposited during the Wisconsinan glacial advance approximately 10,000 years ago. This unit generally ranges in thickness from 8 to 12 feet below the site. Underlying the till deposits is the Orangeville Shale consisting of soft, light greenish gray shale. This unit is absent under most of the site, however, it has been identified in borings from the southeast portion of the site. Its maximum thickness under the southeast portion of the site is approximately five feet. The Berea Sandstone underlays the glacial drift or Orangeville Shale (depending on whether or not the shale unit is present) and is considered the uppermost aquifer. The Berea Sandstone is generally described as a hard, fine grained sandstone with occasional very thin shale interbeds. The existing water table is located within this unit and the overlying glacial till. In the area of the surface impoundments, the sandstone is a wedge-shaped aquifer which thickens to the northwest from approximately 5 to 23 feet. Underlying the Berea Sandstone is the Bedford Shale. It is generally described as a gray to reddish silty shale with some thin sandy horizons. The on-site borings have not penetrated the entire thickness of the Bedford Shale, however, background information indicates that the unit averages from 50 to 90 feet in thickness. On-site borings which penetrate the Bedford Shale indicate that no mappable sandy horizons exist within the shale for at least 10 feet below the Berea Sandstone.

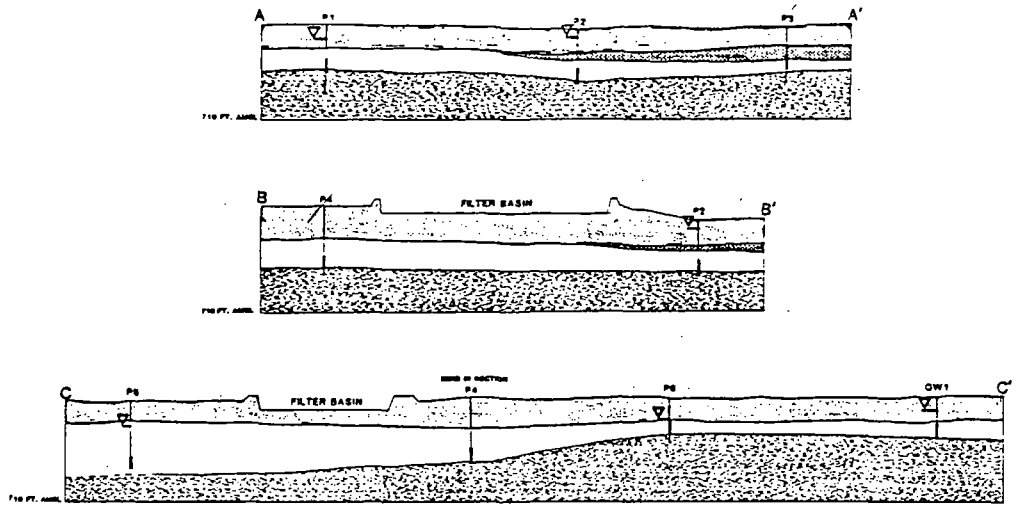
Ground water level elevations at the GMC-Fisher Body plant have been variable historically and may be dependent on the sludge and water content of the lagoons. In February 1985 a water table map was constructed utilizing the existing wells P-1, P-2, P-3, P-4, P-5 and P-6. Refer to Figure 6 which is a reproduction of this map. Since it appeared that upgradient well P-6 might be influenced by ground water mounding, Well OW-1 was installed subsequently to more accurately characterize ground water flow and background conditions.



UNITS ENCOUNTERED IN DRILLING PROGRAM

FIGURE 3.
PARTIAL GEOLOGIC COLUMN FOR LORAIN COUNTY

GEOLOGIC CROSS-SECTIONS
GMC-FISHER GUIDE ELYRIA, OHIO



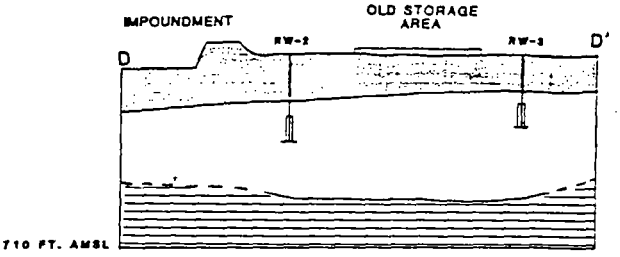
LEGEND

- EXISTING MONITOR WELL
- SCREENED INTERVAL
- END OF BORING
- GLACIAL OVERBURDEN
- ORANGEVILLE SHALE
- BEREA SANDSTONE
- BEDFORD SHALE
- WATER LEVEL

BASED ON BORING LOGS FROM CDM AND EDI ENGINEERING

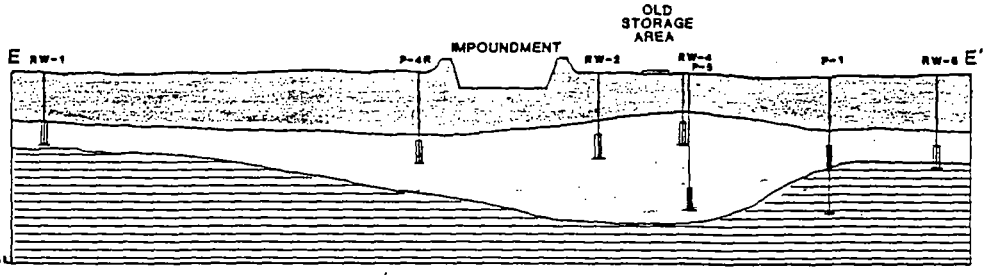
WESTON

FIGURE 4.



0 100 FT.

HORIZONTAL SCALE
VERTICAL EXAGGERATION - 5X



0 200 FT.

HORIZONTAL SCALE
VERTICAL EXAGGERATION - 10X

LEGEND

RW-1 PROPOSED WELL

PROPOSED SCREEN END OF BORING

P-1 EXISTING WELL

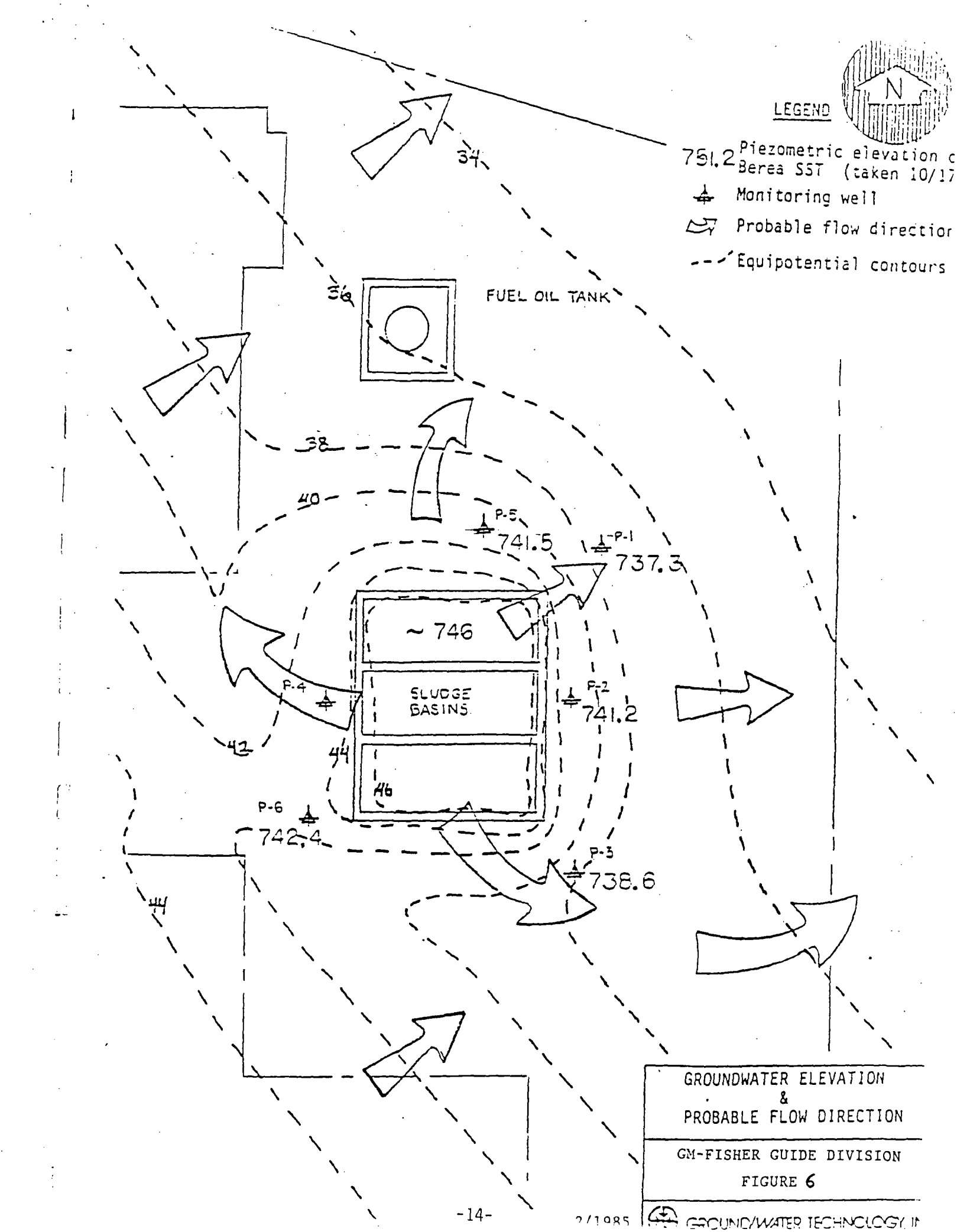
SCREENED INTERVAL END OF BORING

GLACIAL OVERBURDEN

BEREA SANDSTONE

BEDFORD SHALE

FIGURE 5 CROSS-SECTIONS SHOWING PROPOSED WELL NETWORK



GROUNDWATER ELEVATION
&
PROBABLE FLOW DIRECTION

GM-FISHER GUIDE DIVISION
FIGURE 6

2/1985 GROUND/WATER TECHNOLOGY IN

Static water measuremen taken in September 1986 did no exhibit a mounding affect but defined a more regional flow direction to the northeast. However, water level measurements taken two months later in November 1986 again reflected a ground water mounding configuration around the lagoons. Refer to figures 7 and 8 for the 1986 maps of the poteniometric surface in the vicinity of the lagoons. Water level measurements taken during the CME inspection on September 4, 1987 (Figure 9) still reflect a ground water mounding configuration in the vicinity of the lagoons although it is less pronounced than in 1986.

One constant head test and a series of slug tests were conducted on monitor wells screened within the Berea Sandstone. Permeabilities were found to range from 3.1×10^{-4} cm/sec to 12.5×10^{-4} cm/sec. To better characterize and estimate the hydrogeologic character of the Berea Sandstone in the vicinity of the impoundments, the May 1987 Assessment Plan proposed to perform slug tests at each new monitor well and at existing monitor well P-5.

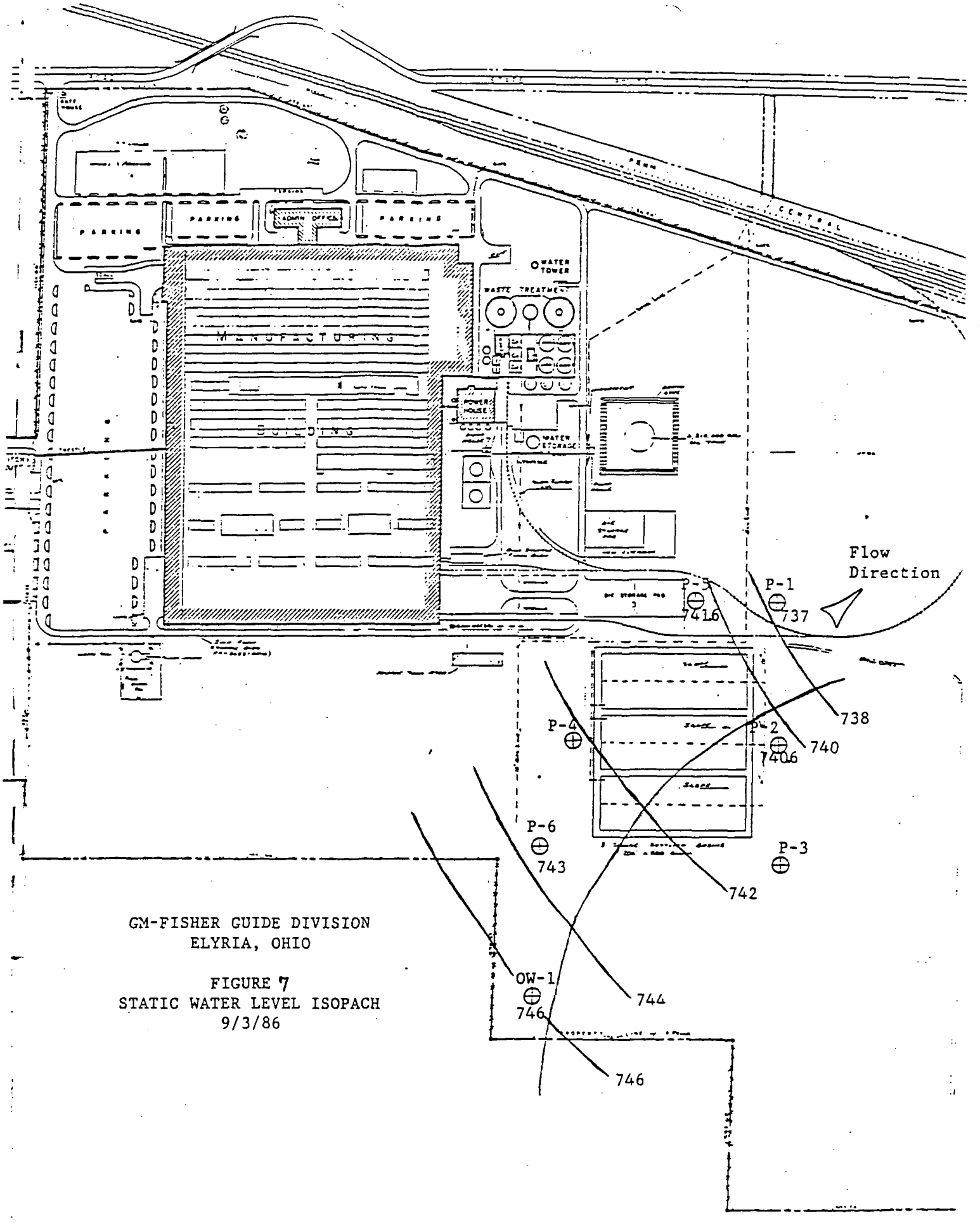
Surface Water

The GMC-Fisher Body, Elyria facility is located within the drainage basin of the West Branch, a tributary of the Black River. The facility is located approximately one mile west of the West Branch.

According to the Comprehensive Water Quality Report (1985), the Black River and tributaries drain approximately 467 square miles of land primarily in Lorain County, Ohio. The East and West Branches of the Black River form the mainstem in Elyria, which then flows north for 15.6 miles to Lorain Harbor in Lake Erie. The East Branch drains 222 square miles of land in Medina and southeastern Lorain County over a distance of 57 miles. The West Branch drains 174 square miles of land primarily in southwestern Lorain County over a distance of 38 miles.

The free flowing section of the Black River courses through bedrock material of relatively impervious shale, so ground water storage contributes very little flow to the stream. Average monthly flows fluctuate widely depending on seasonal precipitation.

The Black River and its tributaries are impacted by both point and nonpoint sources. However, the complexity of pollution sources in this basin makes it difficult to accurately determine the point versus nonpoint relationship. Effluent from the lagoons at the GMC Fisher facility was conveyed by gravity to the storm sewer by a network of four inch drain tiles. The effluent was then discharged to the West Branch under an NPDES permit.



GM-FISHER GUIDE DIVISION
ELYRIA, OHIO

FIGURE 7
STATIC WATER LEVEL ISOPACH
9/3/86

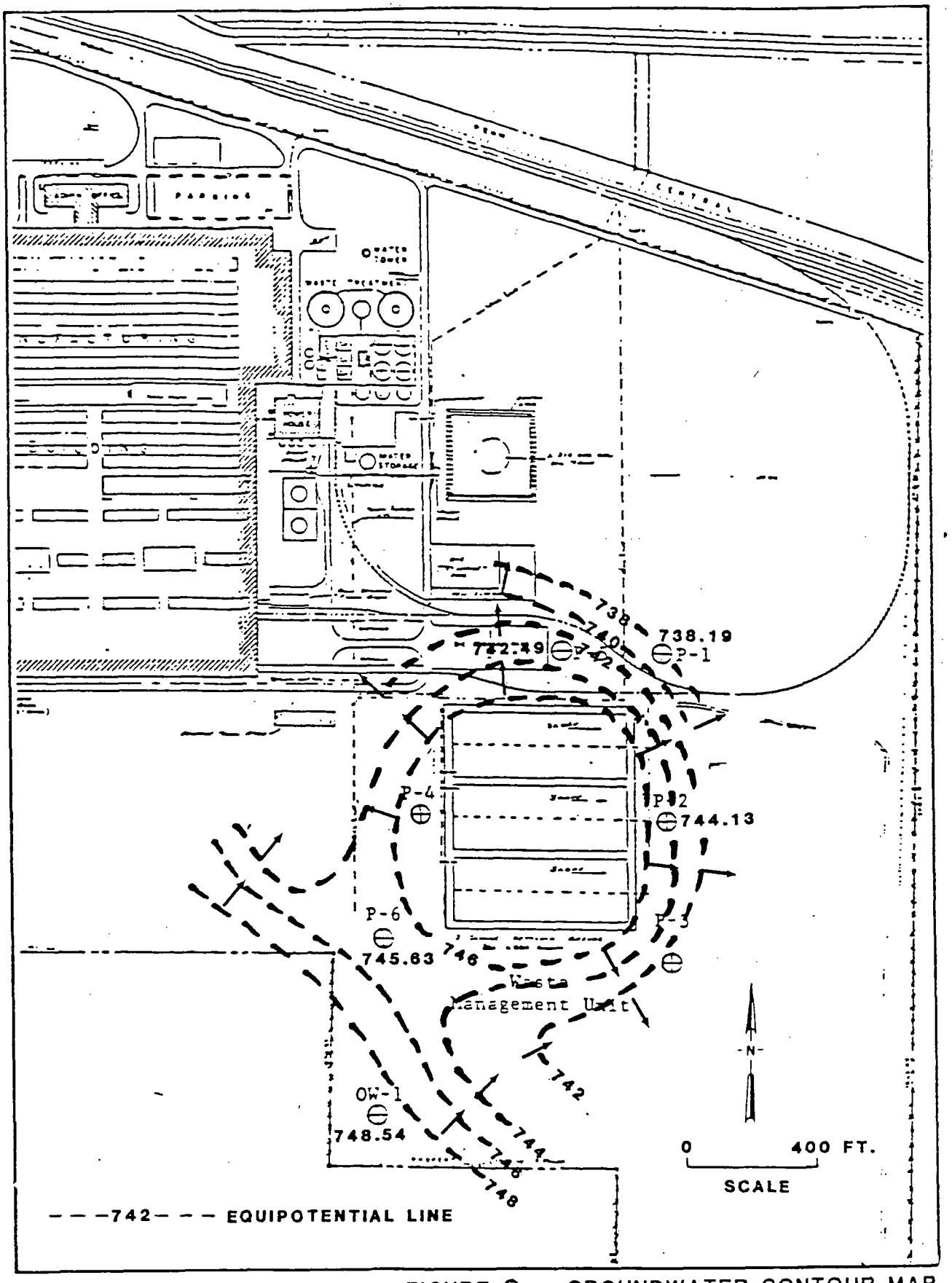


FIGURE 8— GROUNDWATER CONTOUR MAP
BASED ON READINGS OBTAINED IN NOVEMBER, 1986

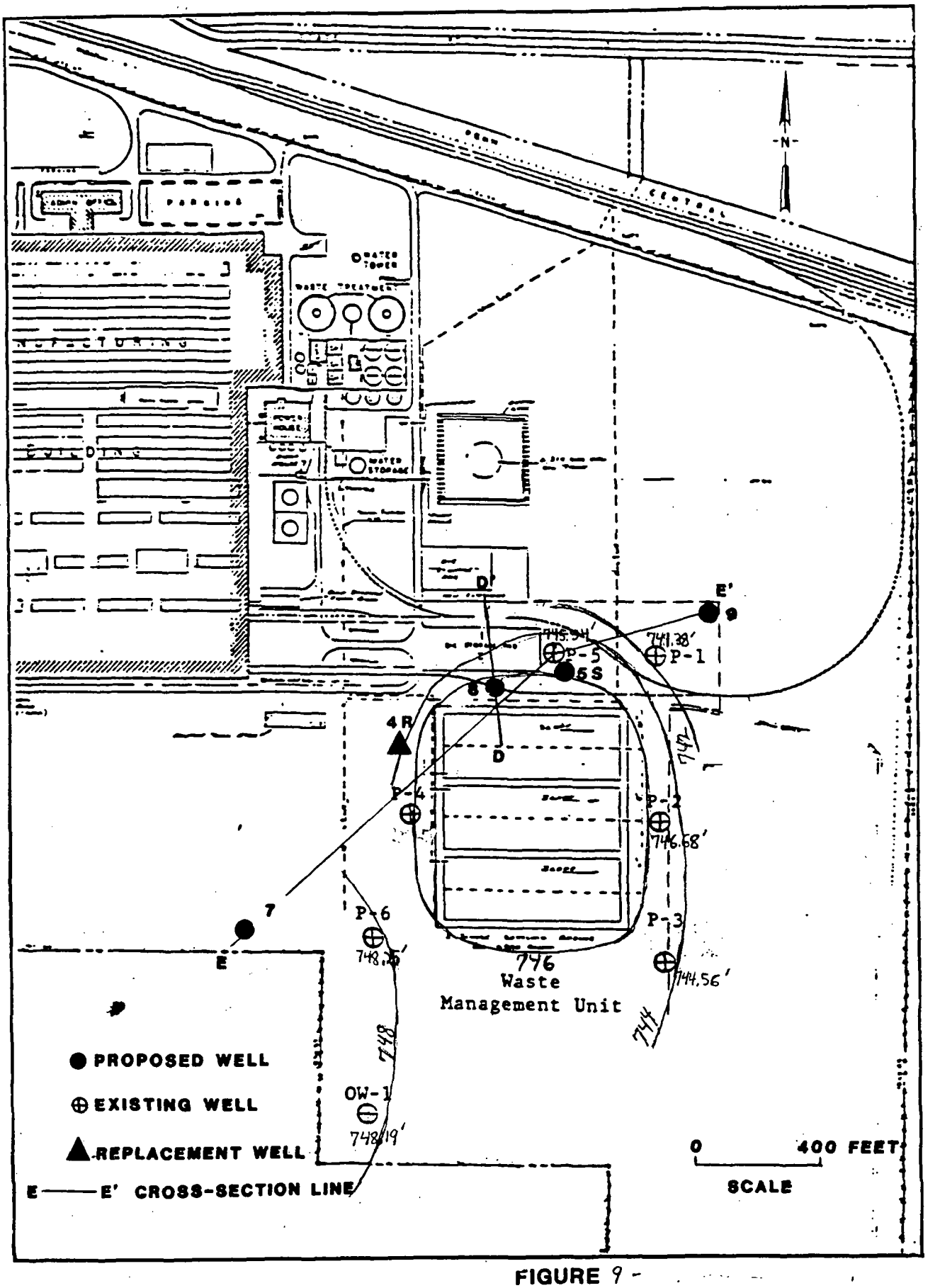


FIGURE 9 -

Groundwater Contour Map
September, 1987

Monitor Well Locations

Presently, seven monitoring wells have been installed near the sludge impoundments. Between May 13 and May 19, 1981 four borings were advanced around the active sludge disposal area at the Fisher Body Division, General Motors Corporation in Elyria as part of a geotechnical investigation undertaken to meet the requirements of 40 CFR, Part 265, Subpart F. Each of the four borings was constructed into a monitor well and labeled P-1, P-2, P-3 and P-4. After review of the initial findings of the geotechnical investigation, two additional wells (P-5 and P-6) were installed around the sludge lagoons during the week of July 26, 1981. Well OW-1 was installed in December 1985 to more accurately characterize background ground water quality in the area of the sludge impoundments. Well P-4 was destroyed by vehicular traffic and has since been adequately sealed. Refer to Figure 10 for the location of the existing monitor wells.

The revised monitoring well strategy set forth in the May 1987 Assessment Plan proposed to replace Well P-4 and install four additional monitor wells (monitor wells 5S, 7, 8, and 9). These wells were installed during the week of August 31 to September 4, 1987. Additionally, monitor well 10 was installed at the southern boundary of the lagoons as a result of the EM-34 survey that was conducted in June 1987. The proposed locations for these wells are illustrated in Figure 10. This does not include the location of monitor well 10. Cross-sections relating the new wells to the site stratigraphy are depicted in Figure 11.

According to the May 1987 Ground Water Quality Assessment Plan, Phase 2, monitoring well 4R will replace its closed, non-functioning counterpart. The location of well 4R is slightly north of its original location to provide better hydrologic control for defining the ground water mound. Monitor well 7 is located approximately 400 feet west of the southwestern corner of the southern most impoundment. Based on present hydrogeologic interpretations of the ground water mound size and geometry, the location of this well will enhance upgradient control for both water quality and potentiometric surface elevation. It will supply additional stratigraphic control for the Berea Sandstone and provide better definition of the upgradient extent of the ground water mound. If it is determined after installation that monitor well 7 may still be impacted by the ground water mound, the assessment plan states that an additional ground water monitoring point may need to be installed further upgradient of this location.

Monitor wells 8 and 5S will be used in conjuction with existing well P-5 to determine if the volatile organic contamination in this area is related to the surface impoundments. Monitor well 8 is located north (downgradient) of the impoundments but south (upgradient) of the former dye storage impoundments and south (upgradient) of the former dye storage pad used to isolate potential volatile constituents emanating from the impoundments. This well is screened in the upper part of the Berea Sandstone. Monitor well 5S is clustered next to the existing deeper well P-5. The new well is screened in the upper portion of the Berea Sandstone. The May 1987 Assessment Plan states that, in addition to providing an effective monitoring point for downgradient migration of both light and heavy constitutents, the water levels obtained from this well cluster will be used to determine vertical gradients within this portion of the aquifer.

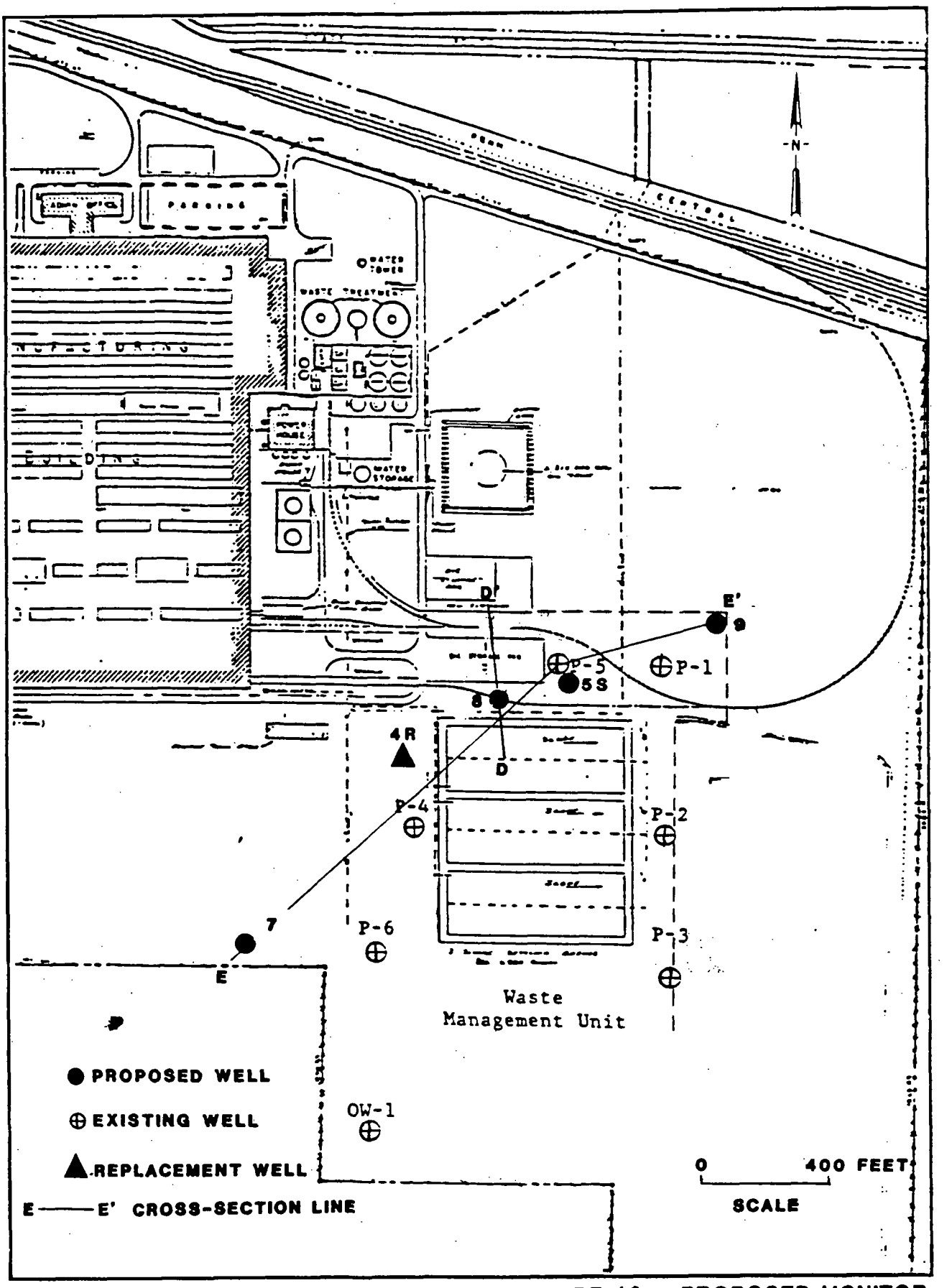
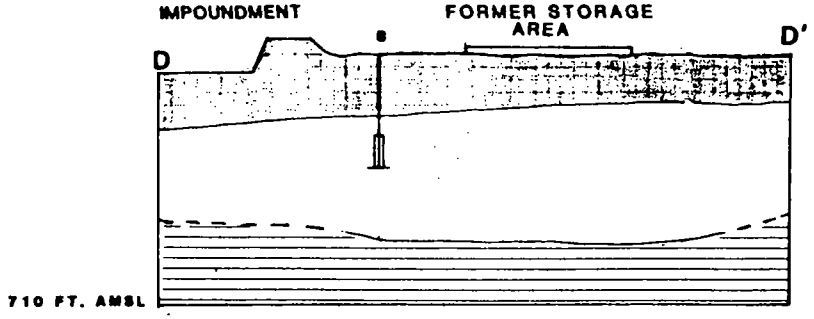
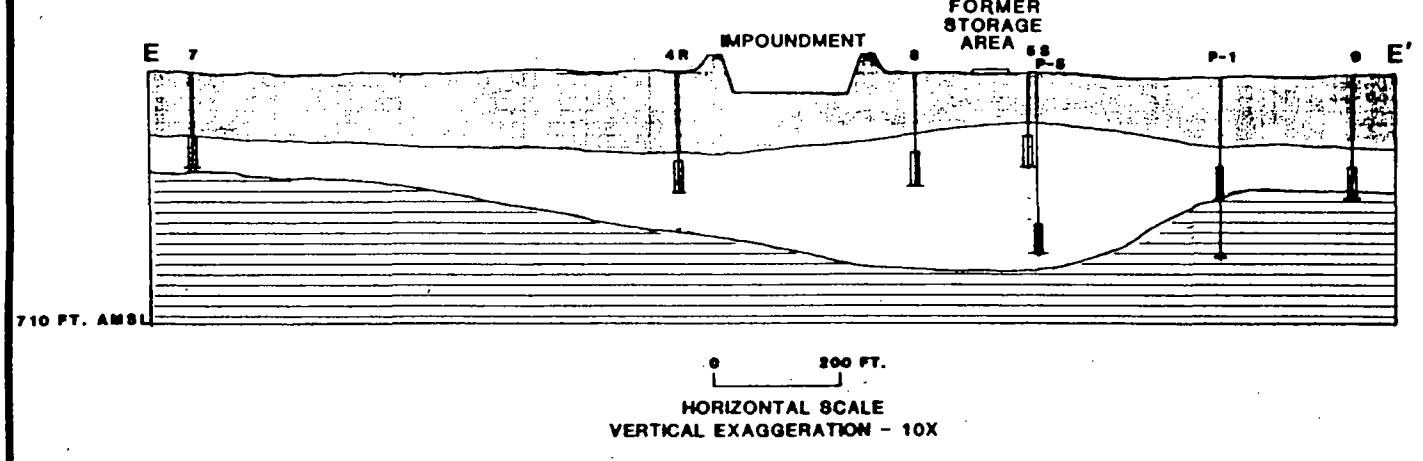


FIGURE 10 PROPOSED MONITOR WELL LOCATIONS





LEGEND

- 8 — PROPOSED WELL
- PROPOSED SCREEN END OF BORING
- P-1 — EXISTING WELL
- SCREENED INTERVAL END OF BORING
- GLACIAL OVERBURDEN
- BEREA SANDSTONE
- BEDFORD SHALE

FIGURE 11 - CROSS-SECTIONS SHOWING PROPOSED WELL NETWORK

Monitor well 9 is locat at the furthest downgradient p. .t possible without being potentially impacted by the past disposal areas. The exact placement of this well was refined according to the results of the geophysical survey performed during the week of June 15, 1987. The well is screened at the base of the Berea Sandstone which, at this point, is anticipated to be approximately only 9 feet thick based on the well log from existing well P-1.

Two shallow soil borings were performed adjacent to existing monitor wells P-2 and P-3. The primary purpose of these borings will be to determine the nature of the overlying glacial till materials in these areas. The May 1987 Assessment Plan states that particular attention will be given to defining whether water table conditions exist within the glacial till. The borings were to extend only into the top of the underlying Orangeville Shale. The assessment plan also states that if it is determined that water table conditions exist within the glacial overburden, and if hazardous waste or hazardous constituents have been released to ground water as determined by the proposed study, then additional ground water monitoring points may need to be installed at these points and screened in the glacial overburden.

Monitor Well Construction

The existing seven wells are constructed of 2-inch inner diameter (I.D.) PVC with glued joints. All screens are five-feet long. A gravel pack extends from the base of the well screen to approximately one foot above the top of the screen. One foot of sand was placed above the gravel pack and the remainder of the annular space backfilled with a bentonite slurry. Protective steel casings were placed over the PVC risers at the surface.

According to the May 1987 Assessment Plan, the drill rig, all drillers tools, and all well construction materials would be thoroughly decontaminated using a portable steam cleaner prior to drilling each new well. Drilling and sampling was completed utilizing a water washed, rotary tricone drilling configuration. Drilling water was obtained from the GMC-Fisher Guide plant which obtains its water from the City of Elyria municipal water supply. A sample of the water was collected and analyzed prior to drilling activities to document the water quality. A split-spoon sampler was used to obtain subsurface soil samples through the unconsolidated glacial overburden. The split spoon samples were collected continuously for purposes of defining subsurface stratigraphy. The May 1987 Assessment Plan states that particular attention would be given to defining the water table, permeable zones, soil moisture conditions and mottling within the glacial overburden.

Monitor wells 4R, 5S, 8, 9, and 10 were constructed of stainless steel. Monitor well 7, was constructed using 2-inch diameter, flush-threaded PVC casing. The screen length is 5 feet with continuous slot openings of 0.010 inches and tipped with a PVC plug on the bottom of the screen. The annular space around the screen was back-filled with silt free flint sand (WB 40 grade) to a height no more than two feet above the top of the screen. A two-foot thick seal of compressed sodium bentonite pellets was placed above the sand pack. The pellets were then soaked with distilled water and allowed to expand approximately 15 to 20 minutes. The remaining annular space was filled with a cement-sodium bentonite grout placed with a tremie pipe. The PVC riser will be covered with a loosely fitting, vented PVC cap. A four-inch diameter galvanized steel, locking protective casing was installed at the surface with a concrete anchor and runoff diversion apron. In heavy traffic areas three, eight-foot guard posts were installed around the well head to prevent vehicular damage to the well. The protective casing includes a drain hole to prevent water from standing and freezing between the two casings.

DETECTION AND ASSESSMEN ONITORING

First year, quarterly RCRA monitoring for background groundwater quality was conducted in 1982 and was followed by semi-annual sampling beginning in May 1983. Data comparison at the end of each semi-annual sampling episode in 1983 and 1984 indicated statistically significant differences against the 1981 background and upgradient data for TOX, pH, specific conductance and TOC.

General Motors Corporation contracted Ground/Water Technology, Inc. to develop a Groundwater Quality Assessment Plan which was subsequently submitted to Ohio EPA in August 1984. Field work on the assessment was initiated in October 1984 and the investigative findings were discussed in a February 1985 report by Ground Water Technology. This report indicated that various non-hazardous parameters such as chloride and sulfate appeared to be entering the ground water. In addition, elevated levels of volatile organic compounds were found in well P-5. These compounds were primarily trans -1, 2- dichloroethene and trichloroethene.

In October 1986 the Ground Water Quality Assessment Program - Proposed Plan For Phase II was submitted to OEPA by the Chester Engineers. The main objectives of the Phase II assessment program were to more accurately define the horizontal and vertical configuration of the non-hazardous constituent plumes and to detemine the source of the volatile organic compounds in the well P-5. Concentrations of chloride and sulfate in monitor wells during a June 1986 sampling were represented by isopach maps in the 1986 report. These maps are included in this CME report as Figures 12 and 13.

The assessment plan submitted by Chester Engineers in October 1986 was not implemented by General Motors Corporation. Another Ground Water Quality Assessment Plan-Phase II was completed by Weston Inc. and submitted to OEPA in December 1986. This document was revised in March and May 1987. Ohio EPA has reviewed the May 1987 Ground Water Quality Assessment Plan-Phase II and General Motors Corporation is currently implementing the plan. An electromagnetic terrain conductivity survey was conducted during the week of June 15, 1987. This study was used to further refine the siting of additional monitor wells. Subsequently, six additional monitor wells were installed around the lagoons during the week of August 31 - September 4, 1987.

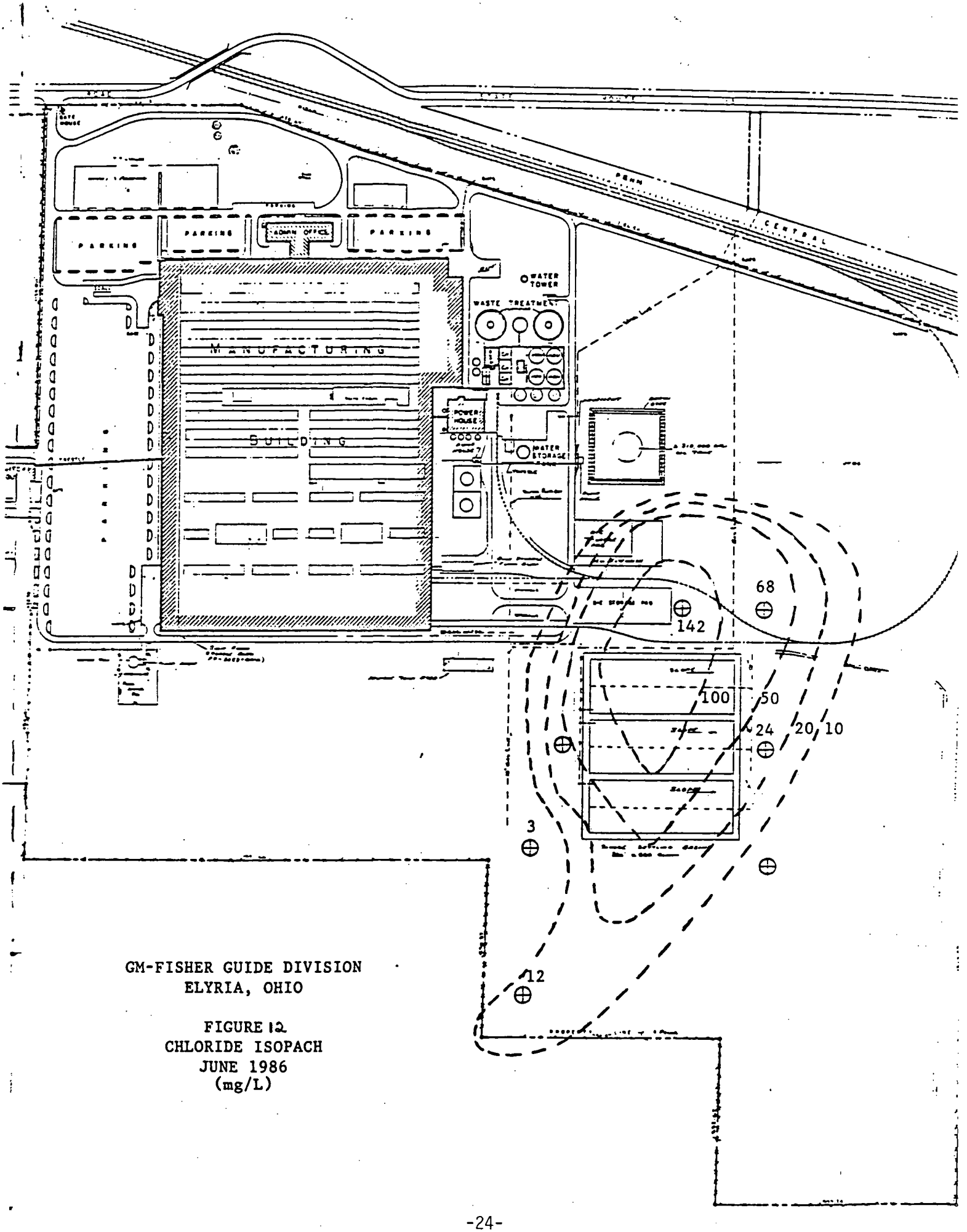


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FIGURE 12
CHLORIDE ISOPACH
JUNE 1986
(mg/L)

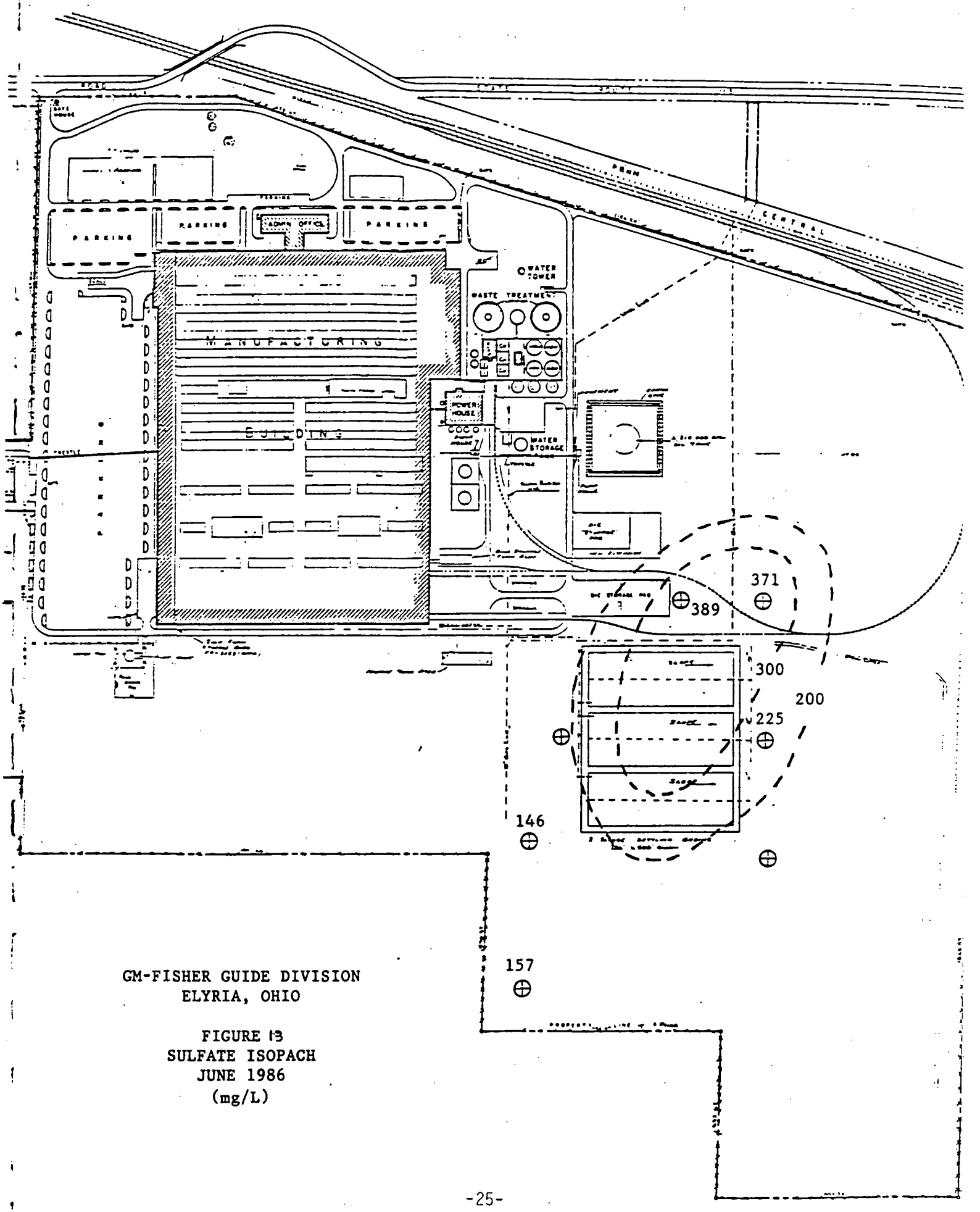

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FIGURE 13
SULFATE ISOPACH
JUNE 1986
(mg/L)

Sampling and Analysis Plan

The current sampling and analysis plan utilized by GMC-Fisher, Elyria is entitled Monitoring Well Sampling Specifications and is maintained on file at the facility. The plan includes procedures and techniques for sample collection, sample preservation/shipment, analytical procedures and chain-of-custody control.

Sampling Schedule and Protocol

Sampling procedures were not observed during the CME inspection. Therefore, the following sections of the Appendix A checklist were completed based mainly on a records review and verbal communication with facility personnel and the facility's consultant: Section II - Field Evaluation; Section III - Review of Sample Collection Procedures; Section IV - Review of Sample Preservation and Handling Procedures; Section V - Review of Chain-of-Custody Procedures; Section VI - Review of Quality Assurance/Quality Control; and Section VII - Surficial Well Inspection and Field Observation.